Claims

1. A device for temporary fixation of a portable cutting machine (10) to a template (12) for making holes and/or recesses in a workpiece (14), comprising:
a guide sleeve (20) having a tubular hub (30) with an outer diameter corresponding to an inner diameter of an aperture (16) in the template (12), a forward end of the hub (30) having radially extending lugs (24) configured and located so as to match corresponding recesses (18) in the aperture (16) during insertion of the guide sleeve (20) therein and to obtain a locking engagement with an inner surface of the template (16) after a partial rotation of the guide sleeve (20) relative to the template (12), and a rearward end of the hub (30) being connected to a tubular adapter socket (34) to be mounted to a nose portion (38) of the cutting machine (10); and
a tensioning unit (40, 42, 46, 48) mounted to the adapter socket (34) for axial displacement relative thereto and having a forward end surface for engagement with an outer surface of the template (12).

2. The device according to claim 1, wherein the tensioning unit comprises a tensioning ring (40) axially movably attached to the adapter socket (43) by means of a screw thread joint, and a pressure plate (46) configured to rest against the outer surface of the template (12) and rotatably and axially supported relative to the tensioning ring (40) by means of an intermediate bearing (48) such that the pressure plate (46) can non-rotatably engage the outer surface of the template while allowing a rotary movement of the tensioning ring (40) relative to the adapter socket (43) and the pressure plate (46).

3. The device according to claim 1 or 2, wherein the hub (30) of the guide sleeve (20) is detachably connected to the adapter socket (43) by means of a base plate (32) and screw joints (36).

4. The device according to any one of claims 1-3, wherein the tensioning ring (40) is provided with wings (42) for turning the same relative to the adapter socket (34).

5. The device according to any one of claims 1-4, wherein the pressure plate (46) comprises at least three pressure elements which are individually articulated by ball joints so as to be automatically adjustable to an inclination of the outer surface of workpiece.

6. An orbital machining apparatus for producing a hole and/or a recess in a workpiece by means of a cutting tool, said apparatus comprising:

a first actuator (52) configured for rotating the cutting tool (50) about its longitudinal center axis during the machining of the hole;

a second actuator (60) configured for moving the cutting tool (50) in an axial feed direction substantially parallel to said tool axis, said second actuator (60) being simultaneously operable with said first actuator (52);

a third actuator (58) configured for rotating the cutting tool (52) about a principal axis, said principal axis being substantially parallel to said center axis of the tool and coaxial with a longitudinal center axis of the hole to be machined, said third actuator (58) being simultaneously operable with said first and second actuators (52, 60);

a radial offset mechanism configured for controlling the radial distance of the center axis of the cutting tool from said principal axis, said radial offset mechanism comprises:

an inner cylindrical body (62) having an eccentric cylindrical hole, said eccentric hole having a longitudinal center axis that is parallel to and radially offset from a longitudinal center axis of said inner body (62), said eccentric hole being configured to radially and rotatably support a spindle unit (54) for operating said cutting tool (50); and

an outer cylindrical body (64) having an eccentric cylindrical hole, said eccentric hole of said outer body (64) having a longitudinal center axis that is parallel to and radially offset from a longitudinal center axis of said outer body, said inner cylindrical body (62) being radially supported in said eccentric hole of the outer

cylindrical body (64) and rotatable therein so as to adjust the radial distance of said center axis of the cutting tool (50) from said principal axis; and

a mechanism for locking the outer and inner cylindrical bodies (64, 62) together after setting a desired eccentricity thereof, **characterized** in that

the locking mechanism comprises mutually matching tapered surface sections (72, 74) adjacent front end portions of the outer and inner cylindrical bodies (64, 62), and a tightening nut (70) acting on a rear end portion of either one of the cylindrical bodies for clamping the tapered surfaces (72, 74) together to thereby fixate the mutual rotary positions of the cylindrical bodies (62, 64).

7. A radial offset mechanism configured for controlling the radial distance of a center axis of a cutting tool of an orbital cutting machine from a principal axis, said radial offset mechanism comprises:

an inner cylindrical body (62) having an eccentric cylindrical hole, said eccentric hole having a longitudinal center axis that is parallel to and radially offset from a longitudinal center axis of said inner body (62), said eccentric hole being configured to radially and rotatably support a spindle unit (54) for operating said cutting tool (50); and

an outer cylindrical body (64) having an eccentric cylindrical hole, said eccentric hole of said outer body (64) having a longitudinal center axis that is parallel to and radially offset from a longitudinal center axis of said outer body, said inner cylindrical body (62) being radially supported in said eccentric hole of the outer cylindrical body (64) and rotatable therein so as to adjust the radial distance of said center axis of the cutting tool (50) from the principal axis; and

a mechanism for locking the outer and inner cylindrical bodies (64, 62) together after setting a desired eccentricity thereof, **characterized** in that

the locking mechanism comprises mutually matching tapered surface sections (72, 74) adjacent front end portions of the outer and inner cylindrical bodies (64, 62), and a tightening nut (70) acting on a rear end portion of either one of the cylindrical bodies for clamping the tapered surfaces (72, 74) together to thereby fixate the mutual rotary positions of the cylindrical bodies (62, 64).